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Relationship between perianal diseases and toilet habits

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Abstract
Aim: In this study, we aimed to examine the relationship between perianal diseases and body mass index, smoking status, alcohol consumption, dietary and exercise habits, and toilet habits and to compare individuals with and without perianal diseases.
Material and Methods: This case-control study was conducted by administering a questionnaire to 280 individuals, 140 patients and 140 controls, who presented to the General Surgery Training Outpatient Clinic of Konya City Hospital for any reason between November 1, 2021, and January 1, 2022.
Results: Of the participants, 43.5% were female and 56.5% were male. While 70.7% of the participants were aged 18-55 years, 29.3% were aged 56 years and older. The rate of smokers was statistically significantly higher in the patient group than in the control group. Individuals who consumed fiber-rich foods every day were 0.279 times less likely to have perianal diseases than those who consumed high-fiber foods once a month. In addition, those consuming high-fiber foods several times a week were 0.049 times less likely to have perianal diseases than those consuming high-fiber foods once a month.
Discussion: Hemorrhoidal disease and anal fissure are common diseases that can be easily diagnosed and followed up in primary healthcare services. The most important step in the diagnosis of these diseases is anamnesis and physical examination, and sometimes inspection alone can be sufficient. Primary health care providers evaluating their patients with a biopsychosocial approach and making recommendations will significantly contribute to the quality of life of patients.

Keywords
Bowel Habits, Perianal Diseases, Predisposing Factors, Toilet Habits

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Introduction

The most common perianal diseases (PADs) are hemorrhoidal disease, anal fissures, and perianal fistulas. Hemorrhoids occur when the cushions containing venous structures in the anal canal prolapse distally and undergo venous distension. Anal fissures are usually caused by midline ruptures distal to the dentate line. Anal fissures can be acute or chronic, and are often located in the posterior midline, sometimes anteriorly, and rarely laterally [1,2]. Perianal fistulas usually emerge in the acute phase of sepsis or within six months after the first treatment. These fistulas mostly originate from the infected crypt and pathways opening outward, usually from a previous site of drainage. Abscess drainage is effective in the treatment of approximately 50% of those with anorectal abscesses, with the remaining 50% developing persistent anal fistulas [3].

The normal defecation process is considered to have three components: spontaneous phasic rectal contractions that begin during filling (autonomic process), relaxation of the anal canal through an enlarged anorectal angle (mostly somatic process), and straining (somatic process). Disorders in these processes are thought to play a role in the emergence of PADs [4,5]. In addition, anal fissures and hemorrhoidal disease are affected by many environmental factors, such as constipation, dietary habits, obesity, pregnancy, psychosocial status, smoking, and alcohol consumption [6,7].

One of the parameters affecting the defecation process is the body position during defecation. The squatting position is common in Asian, African, and Eastern countries, and the sitting position is common in Western countries. The literature also indicates that the length of time spent in the toilet may be associated with PADs [2,5,8].

The determination of common sociodemographic characteristics in patients with PADs and the causes of these diseases can assist in the identification of risky individuals. This will help prevent PADs by changing the attitudes and behaviors of individuals while they are still healthy. Considering the physiological and psychosocial problems that PADs can cause individuals, it is extremely important to apply protective measures. In the current study, we aimed to compare individuals with and without PADs (hemorrhoidal disease and anal fissures) in relation to sociodemographic characteristics, body mass index (BMI), smoking status, alcohol use, constipation, presence of irritable bowel syndrome (IBS) and functional constipation (FC) diagnoses, and dietary, exercise, and toilet habits. With this study, we aimed to contribute to the literature in terms of the etiological data on PADs and the sociodemographic characteristics of this patient group.

Material and Methods

Ethical approval was obtained from the Health Sciences University Hamidiye Scientific Research Ethics Committee, with the decision numbered 29/13 taken at the meeting dated September 17, 2021, and numbered 2021/29.

This research was designed as a case-control study and was conducted using the questionnaire method with 280 individuals, 140 patients and 140 controls, who presented to the General Surgery Training Outpatient Clinic of Konya City Hospital from November 1, 2021, through January 1, 2022. The questionnaire was administered to the individuals who met the study criteria and agreed to respond to the face-to-face questionnaire.

The questionnaire consisted of a total of 51 questions presented in two sections. The first section included 30 questions concerning the participants' sociodemographic characteristics, height-weight and BMI, smoking status, alcohol consumption habits, dietary and exercise habits, IBS and FC diagnoses according to the Rome IV criteria, and toilet habits. In the second section, the 21-item Beck Anxiety Inventory (BAI) was used to examine the psychiatric background of the patients. Before the administration of the data collection instrument, informed consent was obtained from all participants. The study was conducted in accordance with the principles of the Declaration of Helsinki.

The patient group consisted of individuals who presented to the outpatient clinic with the diagnosis of hemorrhoids and anal fissures. Perianal fistulas were excluded from the study because they mainly contain cryptoglandular abscesses in their etiology. Therefore, in this paper, the term "PADs" refers to both hemorrhoids and anal fissures.

The control group consisted of patients who presented to the outpatient clinic with other diagnoses (gallstones, multinodular goiter, breast disease, etc.) and were confirmed to have no history of hemorrhoidal disease or anal fissures. Patients with previous PADs were not included in the study. In addition, to reveal the effect of other factors, especially toilet habits in a more objective manner, patients with conditions that could increase intra-abdominal pressure or were caused by increased intra-abdominal pressure were excluded from the sample.

Statistical analysis

The statistical analysis of the data was performed using the SPSS v. 27.0 software package (IBM SPSS, Chicago, IL, USA). Numbers and percentages were used to summarize categorical data. The chi-square (x2) test was used to demonstrate the relationship between categorical variables. A model was constructed using participants' age, presence of IBS, presence of FC, frequency of fiber-high food consumption, duration of defecation, and toilet time to examine the effect of these variables on the presence of PADs. In the logistic regression analysis of this model, the Forward-LR method was used, and the Hosmer-Lemeshow test was conducted to examine the model fit. In all statistical tests, $p < 0.05$ was accepted as the significance level.

Ethical Approval

Ethics Committee approval for the study was obtained.

Results

The study included a total of 280 individuals, 140 (50%) patients and 140 (50%) controls. Table 1 shows the comparison of the sociodemographic characteristics and general characteristics of the participants according to the presence of PADs. Bad habits, such as smoking and alcohol consumption status, of the participants were similar between the patient and the control groups ($p > 0.05$). The rate of individuals evaluated to have minimal anxiety using BAI was statistically significantly higher in the control group than in the patient group ($p < 0.001$).

In this study, there was no statistically significant difference between the patient and control groups in relation to the rate

Table 1. Socio-demographic and General Characteristics of the Patient and Control Group.

		Patients with PADs n (%**)	Controls n (%**)	x^{2***}	P
Gender	Female	72 (51.4)*	50 (35.7)	7.031	0.008
	Male	68 (48.6)	90 (64.3)		
Age	18-55 years	114 (81.4)*	84 (60.0)	15.521	<0.001
	≥56 years	26 (18.6)	56 (40.0)		
Occupation	Risky occupations	26 (18.6)	34 (24.3)	1.358	0.244
	Other	114 (81.4)	106 (75.7)		
Income status	≤3,000 TL	88 (62.9)*	64 (45.7)	8.289	0.004
	>3,000 TL	52 (37.1)	76 (54.3)		
Place of residence	Urban	116 (82.9)	118 (84.3)	0.104	0.747
	Rural	24 (17.1)	22 (15.7)		
Marital status	Married	103 (73.6)	105 (75.0)	0.075	0.784
	Single	37 (26.4)	35 (25.0)		
Body mass index	Underweight-normal	78 (55.7)	86 (61.4)	0.942	0.332
	Overweight-obese	62 (44.3)	54 (38.6)		
Smoking status	Smoker	55 (39.3)*	39 (27.9)	4.100	0.043
	Non-smoker	85 (60.7)	101(72.1)		
Alcohol consumption	Present	9 (6.4)	6 (4.3)	0.634	0.426
	Absent	131 (93.6)	134 (95.7)		
BAI classification	Minimal anxiety	12 (8.6)	66 (47.1)*	72.566	<0.001
	Mild anxiety	50 (35.7)	53 (37.9)		
	Moderate anxiety	42 (30.0)	16 (11.4)		
	Severe anxiety	36 (25.7)	5 (3.6)		
Irritable bowel syndrome	Present	60 (42.9)*	11 (7.9)	45.305	<0.001
	Absent	80 (57.1)	129 (92.1)		
Functional constipation	Present	116 (82.9)*	27 (19.3)	113.209	<0.001
	Absent	24 (17.1)	113 (80.7)		

*Indicates the group causing a significant difference, **Given as column percentages, ***Obtained using the chi-square test, PAD: perianal disease; BAI: Beck Anxiety Inventory

Table 2. Comparisons of Toilet Habits

		Patients with PADs n (%**)	Controls n (%**)	x^{2***}	P
Defecation frequency	Once/more than once a day	81 (57.9)	116 (82.8)	26.159	<0.001
	Three and more than three times a week	29 (20.7)	19 (13.6)		
	Less than three times a week	30 (21.4)*	5 (3.6)		
Duration of defecation	<5 min	52 (37.1)	102 (72.9)*	37.047	<0.001
	5-15 min	64 (45.7)	24 (17.1)		
	>15 min	24 (17.1)	14 (10.0)		
Other toilet habits	Smoking	16 (11.4)	5 (3.6)	8.299	0.016
	Phone/tablet use	17 (12.1)	11 (7.9)		
	Absent	107 (76.4)	124 (88.6)*		
Type of toilet	Squatting	80 (57.1)	91 (65.0)	1.818	0.178
	Sitting	60 (42.9)	49 (35.0)		
Position during defecation (n = 109)	Sitting	54 (90.0)	44 (89.8)	0.001	0.608
	Stool placed under feet	5 (8.3)	2 (4.1)		
	Squatting	1 (1.7)	3 (6.1)		
Cleaning method	Water or toilet paper	32 (22.9)	25 (17.9)	1.079	0.299
	Water and toilet paper	108 (77.1)	115 (82.1)		
Cleaning water temperature	Warm water	21 (15.0)	28 (20.0)	1.212	0.271
	Cold water	119 (85.0)	112 (80.0)		
Delayed defecation	No	82 (58.6)	118 (84.3)*	22.680	<0.001
	In an hour	55 (39.3)	19 (13.6)		
	In more than an hour	3 (2.1)	3 (2.1)		

*Indicates the group causing a significant difference, **Given as column percentages, ***Obtained using the chi-square test, PAD: perianal disease

Table 3. Logistic Regression Model for Factors Predisposing to Perianal Diseases

		β	SE	P	Exp (β)	95% CI
Age	18-25 years (ref)					
	26-35 years	-0.076	0.677	0.910	0.926	0.246-3.490
	36-46 years	0.295	0.709	0.677	1.344	0.335-5.387
	47-55 years	-0.480	0.733	0.512	0.619	0.147-2.601
	≥56 years	1.825	0.683	0.008	6.203	1.626-23.669
IBS	Absent (ref)					
	Present	1.201	0.486	0.013	3.324	1.282-8.620
Functional constipation	Absent (ref)					
	Present	3.088	0.463	0.000	21.943	8.846-54.429
High-fiber food consumption frequency	Every day	-1.278	0.498	0.010	0.279	0.105-0.739
	A few times a week	-3.018	0.680	0.000	0.049	0.013-0.185
	Once a week	-1.408	1.012	0.164	0.245	0.034-1.777
	A few times a month	-1.437	1.021	0.159	0.238	0.032-1.759
	Once a month (ref)					
Defecation frequency	More than once a day (ref)					
	Once a day	1.213	0.787	0.123	3.365	0.719-15.734
	Three and more than three times a week	-0.103	0.735	0.889	0.902	0.214-3.812
	Less than three times a week	0.083	0.767	0.914	1.086	0.242-4.883
Duration of defecation	<5 min (ref)					
	5-15 min	0.802	0.599	0.181	2.230	0.689-7.217
	>15 min	-0.805	0.639	0.208	0.447	0.128-1.564

β: regression coefficient; SE: standard error; ref: reference; Exp (β): odds ratio; CI: confidence interval; IBS: irritable bowel syndrome

of individuals with occupations considered to be risky in terms of PAD development, namely farmers, drivers, students, and civil servants ($p > 0.05$).

Concerning dietary preferences, the rate of vegetarians was similar between the patient and control groups ($p > 0.05$, $x^2 = 1.098$). However, the rates of individuals with a daily consumption of high-fiber foods and those with a daily water consumption of two liters or more were found to be statistically significantly higher in the control group ($x^2 = 52.142$ and $x^2 = 25.583$, respectively; $p < 0.001$ for both). Lastly, the patient group had a significantly higher rate of individuals who did not walk regularly on a weekly basis ($p < 0.001$, $x^2 = 17.367$).

Numerical data and comparisons concerning the toilet habits of the participants are given in Table 2. The type of toilet preferred by the participants, position during defecation, cleaning method after defecation, and preferences related to the use of warm or cold water for cleaning were found to be similar between the patient and control groups ($p > 0.05$).

A model was created using age, presence of IBS, presence of FC, frequency of high-fiber food consumption, duration of defecation, and toilet time to determine risk factors that could have an effect on the development of PADs. It was determined that the established logistic regression model explained 71.0% of the disease status (Nagelkerke's R squared = 0.710) and had an accuracy rate of 87.1% in identifying individuals with PADs (Table 3).

Discussion

In this study, there was a statistical difference between the groups with and without PADs according to gender, and this difference resulted from the significantly higher rate of women in the patient group. In addition, the rate of participants aged 18-55 years was statistically significantly higher in the patient group. In the literature, there are studies showing whether women or men are more likely to be diagnosed with PADs. Therefore, further studies with larger groups are needed on this subject. Consistent with our findings, previous researchers found that the rate of PADs was generally higher in individuals aged below 40 years and decreased after 65 years [9-12]. There are also publications reporting that low socioeconomic status and decreased physical activity may be associated with PADs, which supports our results. Despite the presence of publications indicating that some occupational groups constitute risk factors for PAD, we found no significant difference in relation to the occupation of the participants in our study. This can be attributed to the different working conditions of individuals with the same occupation or the effect of other confounding factors [9,11,13].

In contrast to previous research reporting a relationship between high BMI and the presence of PADs, we observed no significant difference between the patient and control groups in terms of BMI. This may be related to the generally high BMI values in our participants [14,15].

In this study, the rate of smokers was found to be significantly higher in the patient group with PADs. Although there is evidence in the literature showing that the rate of alcohol consumption is as high as the rate of smoking in PADs, we did not determine a relationship between alcohol consumption and the presence of PADs [11,16].

Concerning the relationship of PADs with FC and IBS, similar results have been reported in many studies. Our findings also revealed that the individuals with IBS were 3.324 times more

likely and those with FC were 21,943 times more likely to have PADs than those without these conditions. We found no significant relationship between the toilet type and position and PADs in our study; however, the literature suggests that constipated individuals may have different defecation positions. It is known that constipation and functional bowel disease, which we also detected in our findings, are the causes of anal fissures and recurrent anal fissures, and that prolonged straining may trigger hemorrhoids [17-21].

In this study, important findings were found concerning the relationship between toilet habits and PADs. It was determined that the patients with PADs spent more than five minutes in the toilet for defecation. The rate of defecation less than three times a week was also significantly higher in the patient group. Although we determined that the most common preoccupations of the participants in the toilet were smoking and phone/tablet use, other toilet habits have also been reported in the literature, including reading books and newspapers, as well as smartphone use, especially among young people. Similar to our study, the literature contains evidence that time spent in the toilet is associated with PADs [11,20,22].

There are many studies examining the relationship of PADs with dietary habits and physical activity. It has been reported that high-fiber food consumption is protective against PADs, and increasing the amount of water consumed daily reduces the related symptoms. In our study, the individuals who consumed two liters or more of water per day were at a lower rate in the patient group. In addition, the individuals who consumed high-fiber foods every day were determined to be 0.279 times less likely to have PADs than those who consumed these foods once a month, and the individuals who consumed high-fiber foods a few times a week were 0.049 times less likely to have PADs than those who consumed these foods once a month. Similarly, we observed that the patient group included a lower number of individuals who walked regularly on a weekly basis, confirming the literature suggesting that physical activity accelerates food passage [19, 23].

Among our participants, the rate of those with minimal anxiety according to the BAI scores was statistically significantly higher in the control group than in the patient group. Many studies have reported a relationship between PADs and personality types, anxiety, and depression. Considering that IBS and constipation are also affected by anxiety and depression, the question is whether anxiety and depression are predisposing factors for PADs or cause PADs through these digestive disorders [6,7]. Regardless, it is clear that positive changes that help reduce anxiety will also produce positive results in PADs.

The small number of patients is an important limitation of our study. However, the strengths of our study include the diversity of the data we obtained and the evaluation of many factors. We consider that this study is an important step in terms of guiding further studies to be conducted with a larger number of patients.

Hemorrhoidal disease and anal fissures are problems experienced by many people of all ages. As primary healthcare providers are expected to diagnose these diseases and begin medical or conservative treatment. Considering that a significant portion of individuals with PADs have never attended a hospital, it is important for primary health care providers to evaluate the population they are responsible for in this respect. This depends on the proven predisposing factors and the follow-up of related symptoms and factors by primary healthcare providers.

Conclusion

We consider that our study will contribute to the literature by presenting factors that are effective in PADs and creating a model showing the importance of predisposing factors in the formation of these diseases. This model will assist primary health care providers in identifying which predisposing factor(s) to prioritize. This way, they can play an important role in reducing the prevalence of PADs by encouraging their patients to modify their dietary, exercise, and toilet habits through information and recommendations.

Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and human rights statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

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Conflict of interest

None of the authors received any type of financial support that could be considered potential conflict of interest regarding the manuscript or its submission.

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